



UNIVERSITY OF HELSINKI
ARCTIC PROGRAMME 2022-2030

1. INTRODUCTION

Changes in the Arctic region are historically fast. Global warming and changes in biodiversity in the Arctic affect the health and well-being of the people and ecosystems as well as the stability and security of society in the northern regions and throughout the world. At the same time, economic and political interests in the Arctic region are growing. The big challenges of the Arctic are inter-connected and comprehensive science-based understanding is needed to recognize and solve the challenges.

The University of Helsinki is an Arctic university and harbours top expertise in several disciplines of Arctic research, ranging from natural sciences to humanities. With the Arctic Programme, the UH aims to raise the profile and visibility of its Arctic research, promote the interaction between Arctic disciplines and strengthen strategic collaborations. The UH also aims to influence the Arctic science policy and research funding of the EU.

The UH adheres to the following value-based principles in the Arctic Programme:

- Comprehensive sustainability perspective
- Indigenous peoples' knowledge and rights
- Research ethics
- Open science

2. ARCTIC RESEARCH FOCUS AREAS

The main research Arctic focus areas are the following:

Atmospheric sciences

Atmospheric research focuses on the ecosystem-atmosphere interactions and their anthropogenic perturbation. Atmospheric research aims in comprehensive understanding of carbon cycling, biogenic emissions of different vapours from Arctic ecosystems and their chemical transformation processes. These include aerosols and aerosol-cloud interactions and projections of future changes in the Arctic atmosphere, biosphere and climate. Research comprises long-term observations and targeted field campaigns supported by the laboratory investigations and modelling approaches from process level to large scale climate models.

Ecosystems

Ecosystem research focuses on understanding uniquely varied and heterogeneous Arctic ecosystems, their ecology and structure, carbon flows and climate feedbacks, the effects of human activity on the land and aquatic ecosystems and the evolution and adaptation of plants and animals. Fundamental research question is the interconnections of Arctic ecosystems, their stability and fragility and adaptation to stress in a changing climate. Arctic thresholds are important focal points for sustainability under climate change. To interpret the warning signals early and to make prognoses, research on the flexibility and resilience of ecosystems is needed. To identify and predict the threshold points, statistical mathematics, computational modelling and long time series are utilized. Ecosystem research also integrates biogeochemical, ecological and social-ecological research.

Environmental policy

Environmental policy research focus on energy and climate policy issues relevant in the EU - Russian (geo)political context. One of the focal points is the visibility of fossil and renewable energy, and waste as they traverse in the Arctic area, especially through society in Russia and Finland. Visualization of resource flows gives important information about how these commodities are being (de)politicized and how they are being imagined as part of climate mitigation policies and practices and the broader environmental agenda. Environmental policy research promotes environmentally friendly practices to speed up the transition to a carbon neutral world beyond the Arctic.

Indigenous studies

Indigenous studies at the UH includes both Global Indigenous Studies and Sámi research. Arctic Indigenous research is thus carried out in a unique research environment addressing broadly and deeply Indigenous onto-epistemologies and values. Indigenous Studies provides critical perspectives on human-environment interactions, Indigenous rights, education, well-being, as well as methodological and ethical issues. The Arctic area is home to some 40 different indigenous nations with a great variety of cultural, linguistic, and economic backgrounds. They have a strong role in designing global sustainable futures and bringing Indigenous knowledge and perspectives to the negotiations on climate change and biodiversity.

Sustainable space research

Space physics studies solar-terrestrial interactions, whose consequences are most prominent in the Arctic regions due to the topology of the geomagnetic field. At the UH, the Centre of Excellence in Research of Sustainable Space (FORESAIL) studies the response of near-Earth space to extreme solar driving conditions to mitigate the hazards to which technology in the Arctic is particularly exposed. In addition, FORESAIL investigates the harsh radiative environment experienced by spacecraft on polar and geostationary orbits to improve the radiation tolerance of future satellite missions and reduce the number of space debris.

3. ARCTIC VISION 2030

UH's ambition is to be an international leader in multidisciplinary Arctic research. A working group of Arctic researchers from several faculties and units together with Research Services formulated five main approaches to achieve this vision.

Arctic vision 2030:

1. We have multidisciplinary Arctic research and teaching structures
2. We have strategic collaborations in Arctic research
3. We have new initiatives in Arctic research
4. We have new approaches to sustainable, ethical and inclusive practices and physical presence in the Arctic
5. We maximize the opportunities of and interactions with the EU

3.1. We have multidisciplinary Arctic research and teaching structures

The UH has currently two main thematic Arctic programmes: Arctic theme at the Helsinki Institute of Sustainability Science (HELSUS) and Arctic region in the Ecosystems and Environment Research Programme (ECOENV) at the Faculty of Biological and Environmental Sciences. In addition, research groups at the Institute for Atmospheric and Earth Systems Research (INAR) and several other research units focus on the Arctic.

The Master's programme Environmental Change and Global Sustainability (EGCS) has Arctic-related and Indigenous studies courses in its curriculum and the Climate university offers free on-line courses on sustainability transition.

Arctic Kilpisjärvi and Värriö research stations, together with SMEAR I (Station for Measuring Atmosphere Ecosystem Relations), form the core of the (sub-)Arctic research infrastructure. Värriö and SMEAR I focus on long-term monitoring of atmospheric composition, ecosystem-atmosphere interactions and climate as well as on a multitude of biological variables. The stations serve as platforms for several EU-level infrastructure projects and targeted field experiments. The UH also actively utilizes international Arctic research stations in Svalbard and Greenland for both long-term monitoring and short-term investigations.

Scattered Arctic research activities were identified as one of the main challenges and important future development area. The underutilized teaching potential of the research stations was also noted.

Actions

- Develop the HELSUS Arctic theme and ECOENV Arctic research focus area
- Networking of Arctic researchers and yearly UH Arctic Science days
- Effective utilization of Arctic Avenue, UArctic and other network resources
- Cross-university Master's Arctic programme and UnaEuropa potential
- Strengthen the role of research stations in teaching activities including high school and elementary school teaching

3.2. We have strategic collaborations in Arctic research

UH is a member of the University of Arctic (UArctic) and partner in Arctic Avenue. The UH participates in large international research programmes such as Pan-Eurasian Experiment Program (PEEX) and has representations in several international Arctic committees and working groups.

To fully utilize existing potential in collaborations, the importance of information-sharing and communication was recognized. In the current political situation, when collaboration with Russia and data obtained from Russia are challenged, new relationships with other Arctic countries should be built.

Actions

- Fully utilize the existing potentials
- Define main strategic Arctic collaborations and partnerships we aim to be the most active in
- Collaborations with both national and world-leading international Arctic research units
- Annual international high-level Arctic meeting
- Maximize the utilization of research stations
- Enhance physical presence in the Arctic

3.3. We have new initiatives in Arctic research

The UH has active and high-level science in many Arctic research areas and experience on which to build new Arctic consortia and partnerships. Comprehensive Arctic interdisciplinary teaching is also our strength. To produce new initiatives, we should strengthen our internal and external dialogue and collaboration. We should also ensure that our initiatives are recognized as world-leading activities.

Actions

- Consortia in Arctic research
- Profiling actions with focus on Arctic
- Explore the possibilities in foundation-based research funding
- Arctic events with invited stakeholders, policymakers and international guests
- Seminars and public events at research stations

3.4. We have new approaches to sustainable, ethical and inclusive practices and physical presence in the Arctic

The UH Arctic and sub-Arctic research stations have local networks and collaborate actively with local stakeholders as well as other research stations in Finnish Lapland, Svalbard and Greenland.

The UH considers research ethics throughout its activities. The UH participates in the creation of ethical guidelines for Sámi research and has membership in the Sámi Truth and Reconciliation Commission. The UH also leads the Nordic Research Network for Sámi and Indigenous Peoples Law. The UH considers the knowledge and rights of Indigenous peoples in all its actions in Arctic region.

Actions

- Interdisciplinary approaches in Arctic research
- Ethical practices and ethical training in Arctic research
- Co-production of research questions and initiatives with local communities
- Diversity in language of reporting and dissemination
- Inclusivity in data management
- Science diplomacy

3.5. We maximize opportunities and interactions with the EU

The UH engages at multiple levels, such as funding programmes and policy initiatives, with the EU and Arctic networks to promote the Arctic issues through research, innovation and policy.

UH welcomes the EU's Arctic Strategy aiming to strengthen EU's engagement in the Arctic emphasizing safety, local and international cooperation, environmental, societal and political sustainability and inclusiveness as well as the needs of Indigenous peoples.

EU is continuing its commitment to support Arctic research through Horizon Europe. A vast part of these ambitious priorities set in the EU's Arctic strategy are yet to be transformed into concrete research and innovation activities which have a key role in safeguarding the Arctic. In addition, these priorities need rapidly adequate funding from the EU.

Through the actions mentioned below, UH seeks to be more prominent in the EU arena and to advocate multidisciplinary approaches to Arctic research.

Actions

- The UH promotes Arctic issues through its existing networks such as the EASAC Environment Panel
- UH researchers join expert groups focusing on Arctic and polar issues
- Publishing and promoting a position paper on Arctic research to influence the Horizon Europe Strategic Plan 2025-2027
- Engaging EU MEPs as UH's Arctic ambassadors
- Working towards the inclusion of Russia in EU's Arctic strategy

APPENDIX

UNIVERSITY OF HELSINKI ARCTIC PROGRAMME 2022-2030 Summary

UH ARCTIC VISION 2030

We are international leader in multidisciplinary Arctic Research

The University of Helsinki is an Arctic university and harbours top expertise in several disciplines of Arctic research, ranging from natural sciences to humanities. The UH aims to raise the profile and visibility of its Arctic research, promote the crossing of borders in Arctic disciplines, strengthen strategic collaborations and enhance internal information sharing. The UH also aims to influence the Arctic science policy and research funding of the EU.

Our Arctic research focus areas are:

- Atmospheric sciences
- Ecosystems
- Global Indigenous studies
- Environmental policy
- Sustainable space research

To achieve our vision:

- We have multidisciplinary Arctic research and teaching structures
- We have strategic collaborations and new initiatives in Arctic research
- We have new approaches to sustainable, ethical and inclusive practices and physical presence in the Arctic
- We maximize opportunities and interactions with the EU

We adhere to the following value-based principles:

- Comprehensive sustainability perspective
- Indigenous peoples' knowledge and rights
- Research ethics
- Open science